



WESTCARB Phase II Progress Report

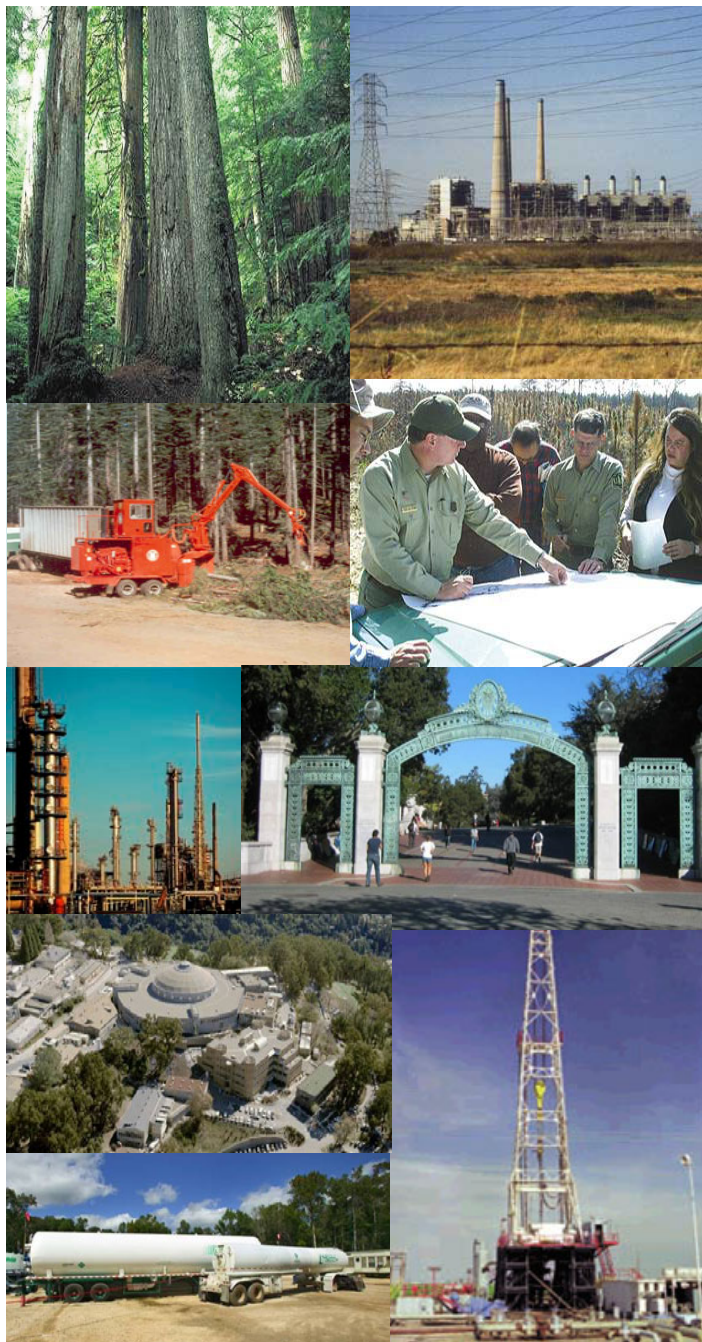
CCS—In the Field and Scaling Up

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*Pittsburgh, Pennsylvania
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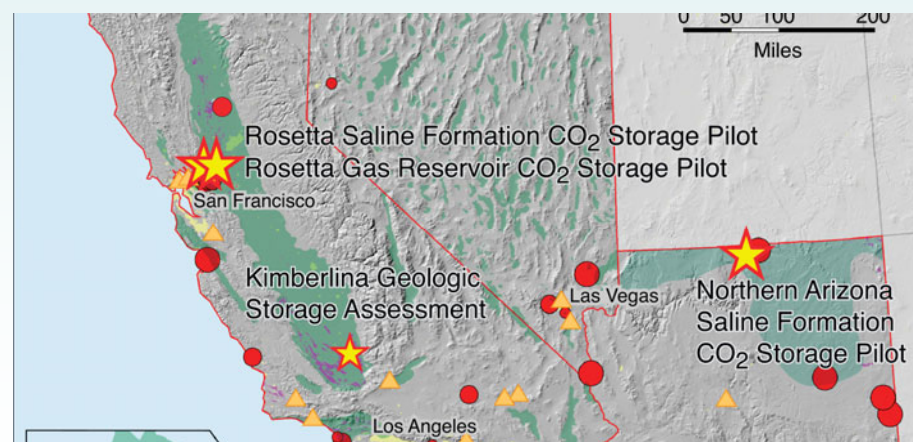
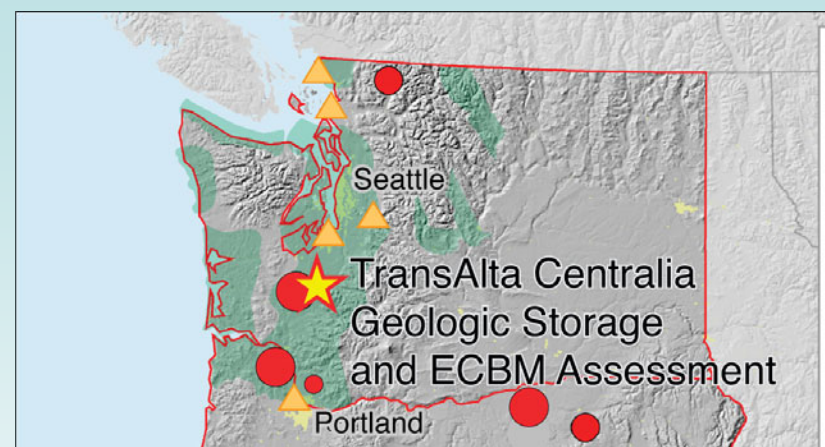


WESTCARB Features Strong and Diverse Set of Partners; Robust Cost Share

- More than 70 organizations comprising:
 - Resource management and environmental protection agencies
 - National laboratories and research institutions
 - Forest-product and ranching interests
 - Conservation nonprofits
 - Climate project standards organizations
 - Energy and pipeline companies
 - Colleges and universities
 - Trade associations and policy coordinating bodies
- We're still growing—additions include Southern California Edison and Arizona Public Service
- Led by California Energy Commission
- Energy Commission/partner cost share >\$11.7 million

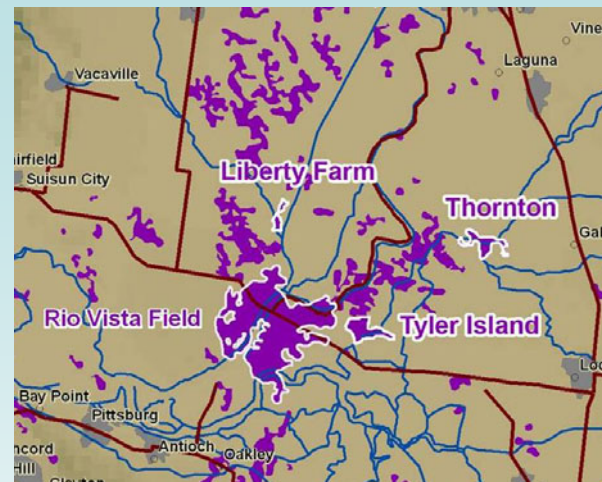
Geologic Pilots Under Way in Arizona, California, and Washington

- Three injection pilots (two sites)
 - Saline formation and depleted gas zone injections in Thornton, CA
 - Saline formation injection in northeast Arizona
- Two “site characterization” pilots
 - EOR/saline in Kimberlina, CA
 - ECBM/saline in Centralia, WA

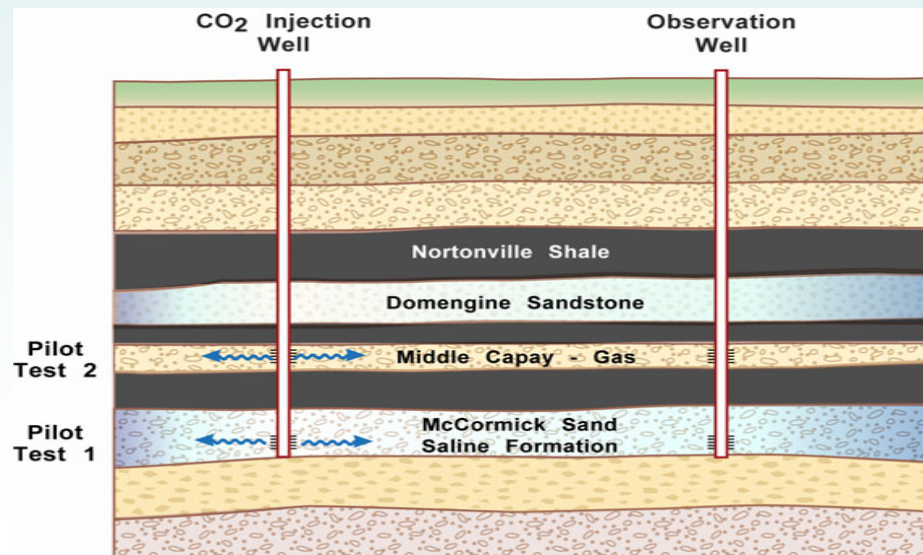


Rosetta Resources Saline Formation & Gas Reservoir CO₂ Storage Pilots

- Target is Thornton Gas Field, a depleted reservoir consisting of a well-defined dome; small field, not unitized
- Drill and complete injection and observation wells ~120 feet apart; truck CO₂ to site
- Inject ~1000 tonnes CO₂ into saline formation below gas/water (~3450 ft below surface)
- Inject ~500 tonnes CO₂ into small depleted gas reservoir (~3050 ft below surface); narrow confined zone minimizes risk of any contamination of residual gas resources



Sacramento-San Joaquin River Delta
gas fields shown in purple

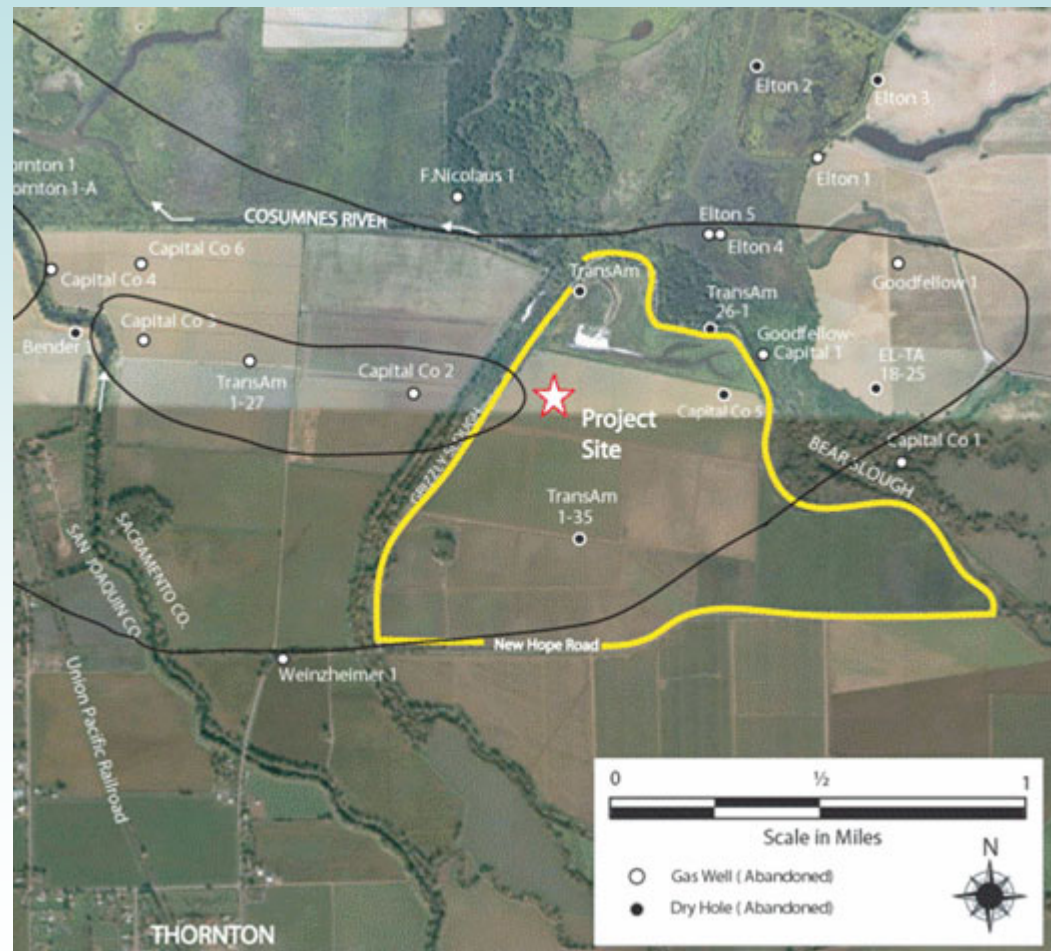


Geologic cross-section at Rosetta pilots site (LBNL)

Lessons from the Real World—Siting

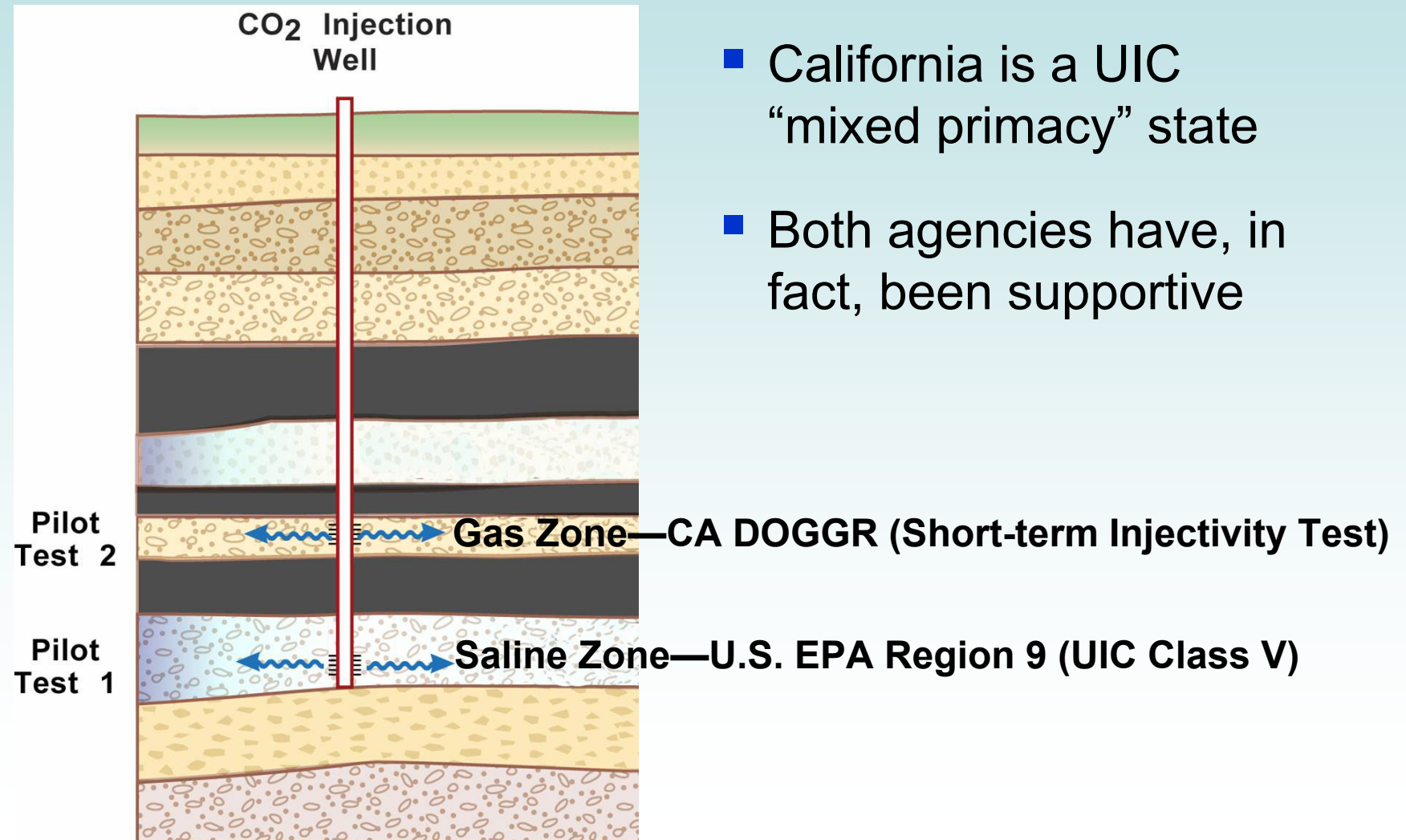
One site; two owners (surface and mineral) with different agendas

- Original proposed site was near an abandoned gas well on a farm field; stalled by potential land sale for development offset
- Current proposed site is on California Dept. of Water Resources land just to the east of original propose site
- Update of the original site's NEPA/CEQA environmental impact questionnaire is under way



Lessons from the Real World—Regulatory

One well; two permitting agencies



- California is a UIC “mixed primacy” state
 - Both agencies have, in fact, been supportive
- Gas Zone—CA DOGGR (Short-term Injectivity Test)**
- Saline Zone—U.S. EPA Region 9 (UIC Class V)**

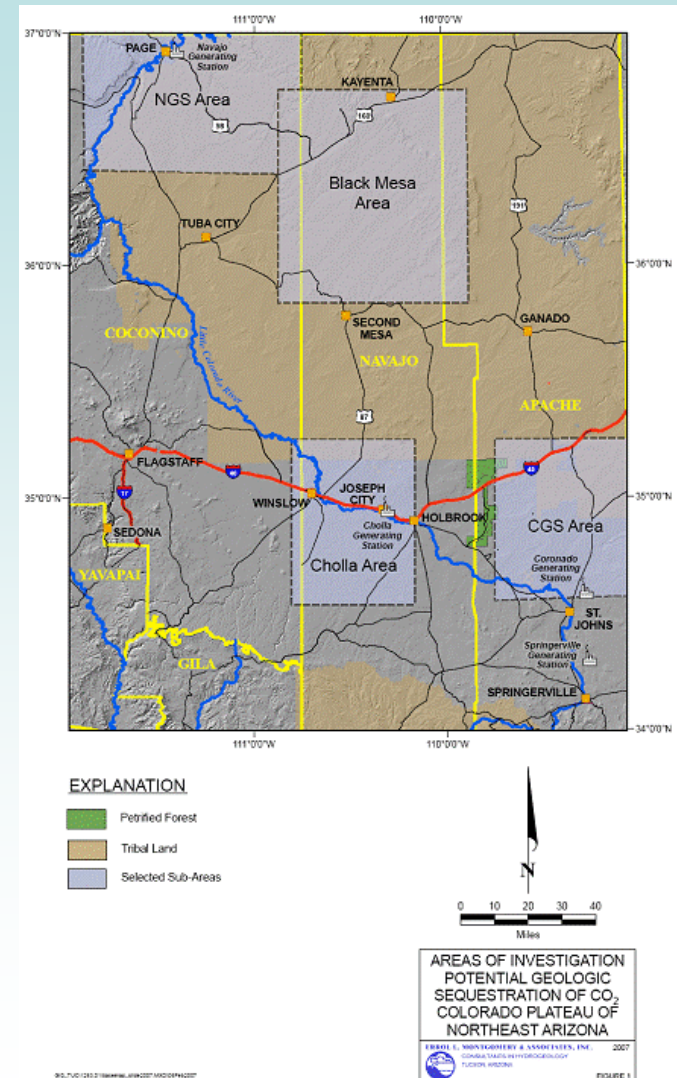
Rosetta Resources Pilots—Next Steps

- California DWR site use approval pending
- Rosetta ready to build access road and drilling pad
- Driller lined up and ready to go
- CO₂ injection scheduled for Fall 2007



Northern Arizona Saline Formation CO₂ Storage Pilot

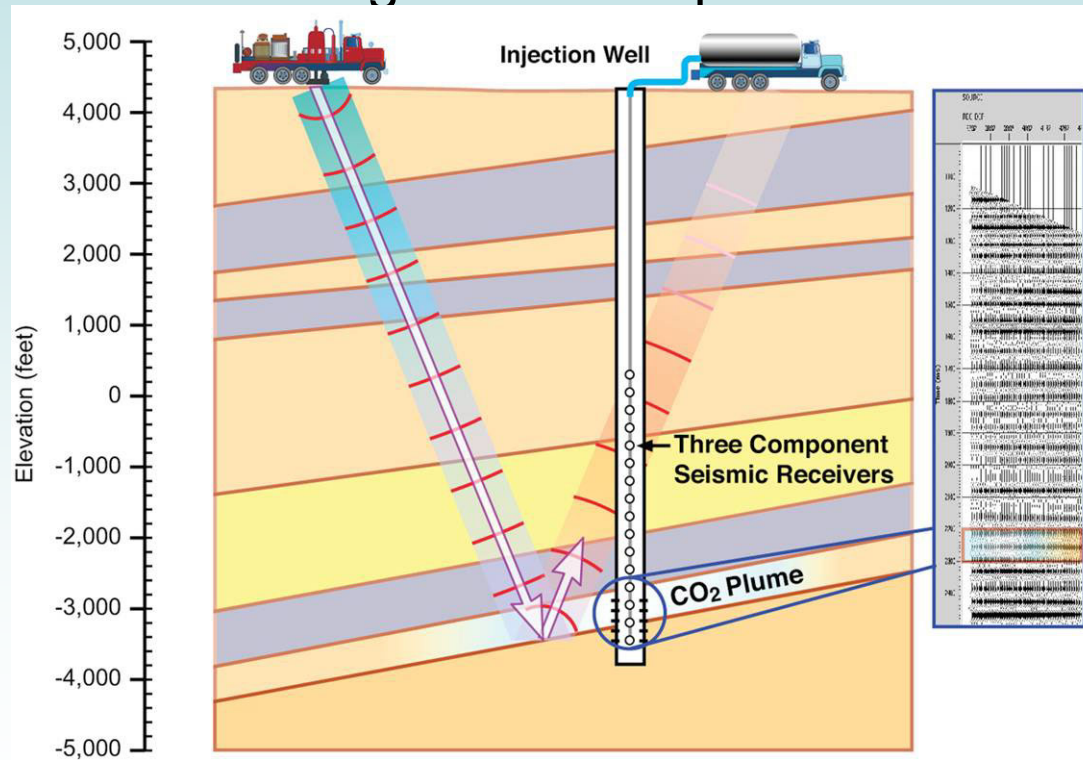
- Target formation screening complete; deep water table and salinity are major factors in site selection
- Lead industrial partner, Salt River Project, convened advisory group of key stakeholders, who recommended preferred site; host receptive, access negotiations proceeding
- Permitting issues discussed with Arizona agencies
- Outreach to local landowners and Navajo Nation under way



Source: Errol L. Montgomery & Associates

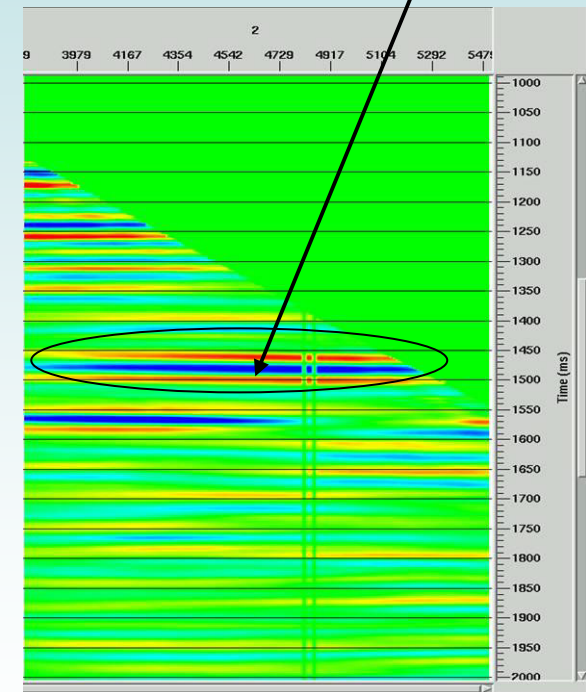
Northern Arizona Saline Formation CO₂ Storage Pilot (cont'd)

Single-well test plan



2000 tonne CO₂ injection planned

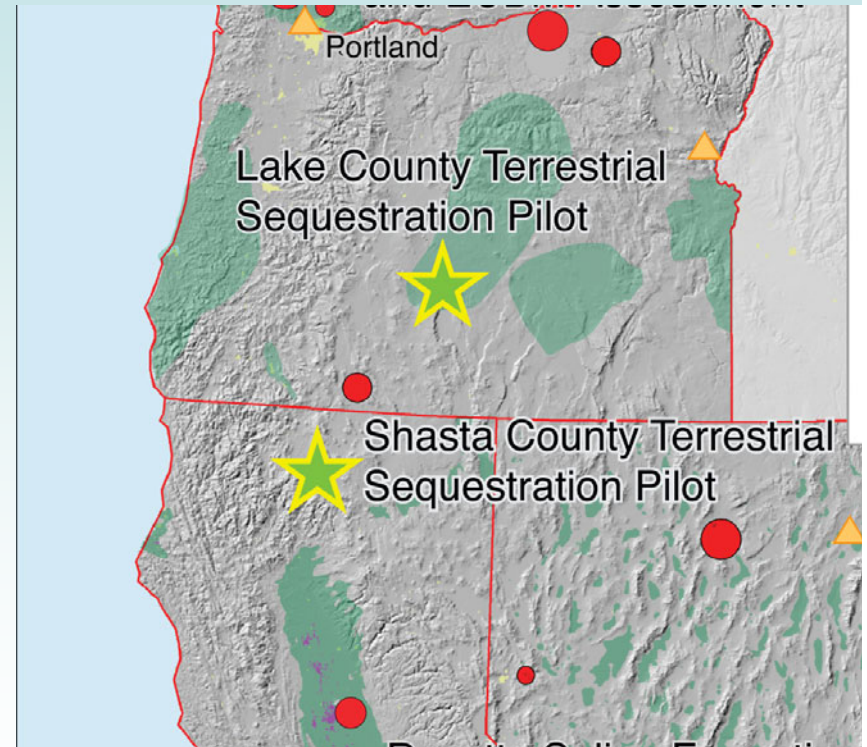
CO₂ plume reflection



VSP Results from Frio Formation

Terrestrial Pilots Under Way in California and Oregon

- Two terrestrial pilots (multiple sites)
 - Forest treatments to reduce severe fires, native-species afforestation, and forest conservation management in Shasta County, CA
 - Forest treatments to reduce severe fires and fast-growth afforestation assessment in Lake County, OR (as part of an Oregon Solutions Project)



Public Awareness Continues to Grow— “May You Live in Interesting Times”

- Climate change–related legislative initiatives becoming abundant in western states
- Media inquiries are increasing
- More voices coming from NGO community, not all in harmony
- WESTCARB holding steady stream of meetings with state and local leaders
- WESTCARB public perception research project under way
- Terrestrial and geologic sequestration each pose unique outreach challenges



WESTCARB Phase III

- California Energy Commission received many qualified responses to a request for expressions of interest; we wish we could select more than one!
- Focus on saline formations
- WESTCARB proposing a “fast start” 100,000 ton-CO₂/yr project (by end of Year 2), followed by a later injection scale-up as new power plant CO₂ capture projects come on-line

Summary

- Phase II pilots are yielding “learning by doing,” real-world results
- Complementary work is progressing on enhanced regional characterization, including improved CO₂ source and capture assessments
- Public interest and scrutiny are on the rise
- We’re excited about Phase III